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SUMMARIES OF ARTICLES.

[ABBREVIATIONS. — *Am. J. Ps.* = *American Journal of Psychology; Ar. f. G. Ph.* = *Archiv für Geschichte der Philosophie; Int. J. E.* = *International Journal of Ethics; Phil. Mon.* = *Philosophische Monatshefte; Phil. Stud.* = *Philosophische Studien; Rev. Ph.* = *Revue Philosophique; R. I. d. Fil.* = *Rivista Italiana di Filosofia; V. f. w. Ph.* = *Vierteljahrschrift für wissenschaftliche Philosophie; Z. f. Ph.* = *Zeitschrift für Philosophie und philosophische Kritik; Z. f. Ps. u. Phys. d. Sinn.* = *Zeitschrift für Psychologie und Physiologie der Sinnesorgane; Phil. Jahr.* = *Philosophisches Jahrbuch; Rev. de Mét.* = *Revue de Métaphysique et Morale.* — Other titles are self-explanatory.]

LOGICAL.

Theorie der Typen-Eintheilungen. BENNO ERDMANN. Phil. Mon., XXX, pp. 15–49, 129–158.

It is an old logical doctrine that the members of a classification are to be so excluded, one from another, that the boundaries of the species of a genus may not run into each other. Kant made a breach in this tradition by his formulation of the principle of continuity. This demands a continuous transition from one species to another, through gradual increments of difference. Kant himself, however, added that the principle of continuity is a mere idea, of formal value, but giving no assurance of corresponding objects in experience. The traditional dogma, therefore, was not entirely broken down by logical discussion. Whewell first contested it from the nature of scientific classification. He asserted that natural groups exist, well determined outwardly from a central type, but not sharply marked off by a boundary line drawn from without. Careful observation shows that our field of thought is largely filled with genera whose species stand in a running connection by reason of a multitude of transitional forms. Such connections are not necessarily continuous. The continuous connections found in mathematics, in geometry and the calculus, are not running connections in this sense. Mathematics gives to quantities separated by distinct differences a continuous connection by considering possible an infinite number of intervening steps. This connection is real, then, only from the point of view of mathematical theory. Excluding such, we here speak of connections of objects which furnish no definite boundaries for classification, because the objects pass into one another in continuous transition. We wish to determine how the logical task of classification is to be performed in such cases. The simplest division of running connections is merely schematic, as in scales of temperature. These constructions are largely arbitrary, and are decided by practical considerations, although they have their ground in the nature of the object. Richer logical relations are encountered when we divide according to types. The first group of such divisions we find where the species of a genus form a series graded through numerous transitions, whose end members differ from one another more than do the intermediate members, or are opposed as contrary or contradictory. Instances of such types are 'moral' and 'immoral.' A second group drops the limitation of the type by the end members. This group includes series of three or more members, and divisions of an aggregate into three or more parts. The classification of substances as 'solid,' 'liquid,' and 'gaseous' is an example of this group. The third group includes cases in which single members stand forth as types for various quantities in rank near them. Instance, the geometrical color-constructions. A fourth group comprises running connections whose members do not form a series, but a loose aggregation. Such are Secchi's spectroscopic types of stars. Organic types were regarded by the Aristotelian philosophy as more fixed. It is in the spirit of that philosophy that the classifications of Linnæus and Cuvier were devised. Even Agassiz, although his classifications reflected nominalism as against the realism of Cuvier, asserts that the logical genera of organisms are manifestations of the thought of the Creator. These classifications are ruined, because they do not include the manifold forms of living and dead organisms in a single thought-construction. Lamarck showed how numerous are the transitions by which species and genera shade into one another, and thus put running connections in the place of sharp distinctions. At present we must take the materials for the investigation of organic types from the theory of evolution. The mere hypothesis of continuous evolution, however, does not furnish sufficient grounds for a classification. We need the groups of marks which experience shows to have great constancy within the field of each genus, the results of adaptation. This gives us the genealogical type. But the abstract type of the logical genus is not present in the same manner in all its species. Some more clearly display the plan of construction of the genus. Such species are representative types. Under special conditions the concept of type gains a third meaning, with reference to the plan of construction of flowers. These are constructive types. The divisions of the human race are closely related to the genealogical and representative types of organisms. Types of languages are somewhat different. In both cases the transitions are gradual, the connections are genetic. Languages, like organic genera, arise, develop as family groups, and become extinct. Yet these analogies are not so close as might at first seem. Organisms are living things, while languages are contents of processes which take place in the most highly developed organisms. Again, although their evolution is organic, languages do not live in the same sense as do organisms. So, finally, the transference of language to other individuals somewhat developed mentally, although we may call it propagation, is analogous to none of the forms which assure the continuance of plants and animal organisms. In philology we find first formal types of languages, resting upon a difference in the speech form. They have been termed morphological types if founded upon the external form, psychological if upon the internal form of speech, but these terms are metaphorical and objectionable. From distinctions in the external form, we derive such linguistic divisions as isolating, agglutinative, and inflected languages. Logically these types are characterized by the fact that they give the most general plans of construction for the grammatical joining of language groups. They become also representative in the same way as do the morphological types of biology. The internal form of language cannot be successfully used as a basis for division, although attempts have been made by Humboldt and Steinthal to combine it with the external form. From another point of view, another analogy with biological types may be perceived. A branch of languages, like the Indo-Germanic, may be bound together by a common descent, which we may regard, figuratively, as a genealogical connection. Subdivisions of the branch give such groups as the Germanic and Romance. We may call these genealogical types, but only in a transferred sense, since they are really different from genealogical types of organisms. Philologists have asserted that the types of isolating, agglutinative, and inflected languages are stages in linguistic development, that inflection presupposes agglutination, and agglutination mere placing side by side. If true, this introduces us to a new form, the period-type. Types of this group are much older than the other forms we have mentioned, and are common to all evolutionary sciences, to history and religion as well as philology and cosmogony. They are contents of development processes of single or collective individual objects. They make it necessary to leave the ground of traditional doctrine in another direction. Logic customarily asserts that only the universal genus is susceptible of division. Here contents of changeable relations and processes of development in individual things permit and require division. We find actual reasons for systematically dividing the whole process of development of the individual into periods. The processes involved stand in a causal connection, a connection which in cases of mechanical energy is strictly continuous, and in cases of living things more nearly so than in other types. In this sense types are not species of a genus, and are not of the same character for purposes of division as generic types. They are generally much more complicated than even the genealogical types.

E. L. HINMAN.

PSYCHOLOGICAL.

Studies in the Psychology of Touch. F. B. DRESSLAR. Am. J. Psy., VI, 3, pp. 313-369.

Our most immediate and fundamental knowledge comes through the skin. This sense is the original sense in the race, and is the one least often impaired. Cutaneous sensations are more directly associated with the self than any other. Double and single sensations of touch are of great weight in building up the distinction between the ego and the non-ego. The fundamental character of touch is recognized by the law in the requirement of physical contact in making an arrest; and is recognized in every-day life by its use in the expression of the strongest affections.— The first of the experimental problems deals with the increase in discrimination with education. The experiments show that the distance between two points necessary for correct discrimination in 75 per cent of the cases was reduced from 22.29 mm. to 2.5 mm. during three weeks' practice. This education affected not only the area of skin experimented upon, but also the corresponding area on the opposite side of the body. Sensations from these educated areas were distinctly different in quality from those from the immediately surrounding skin. Experiments to determine the rate of loss of this effect were begun too late to determine the curve accurately, but were sufficient to prove that the loss is rapid, and decreases in rapidity inversely as the time. The second problem was a determination of the comparative subjective size of a line on the smooth surface of a card, and a line of the same length interrupted by punctures in the card. The experiments prove conclusively that to both passive and active touch the interrupted line seems the longer. The greater the number of punctures, the longer its apparent length. The author generalizes the results of this and the similar optical illusions, together with observations of daily life, thus: "If we have two trains of sense perceptions produced in the mind in equal durations of time, the one which is made up of the greater number of distinct sensations requires of the mind a greater amount of space in its reference to the external world." The third problem deals with an illusion for weights. Sections of a brass tube of unequal lengths were so weighted as to be of equal weights. A large number of school children were asked to arrange them in order of weight. With few exceptions they were arranged in order of size, the smallest seeming the heaviest. A 1½-inch section of the tube — the first in a series of eight — seemed three times as heavy, on the average, as a 5-inch section. If the intermediate members of the series were omitted, it seemed only 2.4 times as heavy. The more able the pupil, as judged by his teacher, the more accurately did his arrangement agree with the general rule. The agreement was closer for adults than for children. Similarly, when pieces of sheet lead of the same size and weight were fashioned into different figures, the more compact seemed the heavier. The author explains the illusion from the association of greater bulk with more effort. Since all stimuli are of the same weight, the larger, upon which the greater effort is exerted, respond more quickly, and thus seem lighter. The firmer the association, as in adults and in clever children, the stronger is the illusion. The article concludes with an account of after-effect phenomena. (1) It was noticed that after the skin of the arm had been in contact with a moving belt of plaited velvet, the velvet seemed to be still in contact, but moving in the opposite direction. An explanation is found in the return rush of the blood which has been swept forward by the motion of the velvet. (2) A few seconds after the skin has been stimulated by contact with a cork point so lightly as to cause no pain, a second, painful sensation sets in, and is succeeded by others of decreasing intensity. These after-sensations were observed to be simultaneous with rushes of blood to the point affected. The author suggests that they may be due to the effect on the nerves of the toxic agents released by the sudden anabolism in the impoverished tissues. (3) Some cases of dermographism in normal subjects are recorded.

W. B. PILLSBURY.

Relation of Interference to the Practice Effect of an Association. JOHN A. BERGSTRÖM. Am. J. Psy., VI, 3, pp. 433–443.

This article offers evidence to disprove Münsterberg's theory that an association discharges by only one path, that of least resistance. The experiments consisted of sorting a pack of cards containing eight cards of each of eight different kinds. The piles were arranged in one order for practice experiments, in another for the interference experiments. It was found in a long series of alternate interference and practice experiments, that the loss in rapidity of sorting due to interference practically equalled the gain due to practice. That the two associations counter-balance, but do not efface each other, is proved by the fact that it takes a third longer time to sort the pack with a third arrangement of the piles than was required for either of the first experiments. Results in apparent accord with the theory are probably influenced by some accessory associations.

W. B. PILLSBURY.

On the Difference Sensibility for the Valuation of Space Distances with the Help of Arm Movements. A. E. SEGSWORTH. Am. J. Psy., VI, 3, pp. 369–408.

The article embodies the results of an investigation made in the Leipsic laboratory. Both the length of the curves made by a pencil held in the hand and the extent of the angle moved through were used as criteria of the amount of motion. The results obtained by the former method are open to errors incident to individual differences in the shoulder joints. The results are: (1) Absolute sensibility is finer for the smaller movements. In the experiments made by the angle method the sensibility for movements towards the horizontal plane followed Weber's law; those away from the horizontal show an increase in sensibility for the larger angles. (2) Upward movements above the horizontal plane are over-valued, downward movements are under-valued. The reverse is true of those below the horizontal. In the series of experiments where a movement with one hand was assumed as a normal, and movements of the other hand compared with it, it was found that this effect increases with an increase in the weight held by the hand making the compared movements. Raising the starting point in the experiments above the horizontal also increases this effect. (3) An increase in the rate of movement decreases the sensibility, except that in experiments by the angle method the reverse held true of movements upward toward the horizontal plane. (4) In the two-hand experiments, when the right hand is the normal, there is an over-valuation, where the left hand is the normal, an under-valuation. Many individual differences appear in the experiments. These are so numerous and important that no definite value can be given for the difference limen. W. B. PILLSBURY.

Ueber die indirekte Sehschärfe. TH. WERTHEIM. Z. f. Ps. u. Phys. d. Sinn., VII, 2 u. 3, pp. 172–187.

Careful experiments on indirect vision show that the isoptric curves are very regular in form, and are approximately parallel to the curve which represents the outside limit of the field of sight. This regularity suggests the possibility of expressing by a mathematical formula the relation between direct and indirect vision ; but the present investigation justifies only the conclusion that the accuracy of indirect vision at any point in the visual field stands in a certain inverse relation to the distance of this point from the fixation point ; and in a certain direct relation to the width of the field of sight at the meridian investigated. The regular course of the isoptric curves seems also to indicate that the diminution in accuracy of vision towards the sides of the retina has its cause in anatomical and functional conditions of the retinal elements. Practice plays an important part in these experiments, which fact suggests that tests of indirect vision have but slight clinical value, where the patients are quite unpracticed. MARGARET WASHBURN.

Erklärung der Brentano'schen optischen Täuschung. F. AUERBACH. Z. f. Ps. u. Phys. d. Sinn., VII, 2 u. 3, pp. 152–160.

The explanation here suggested for this familiar illusion is as follows : —

A line limited by lines which form obtuse angles with it looks longer than one limited by lines which form acute angles with it, because imaginary lines drawn parallel to the principal line and cutting the limiting lines are longer in the former case than in the latter. It follows from this explanation that the illusion will increase as the length of the limiting lines increases ; that it will be greatest when the limiting lines form moderately large angles with the main line, and that any modification of the figure which tends to emphasize the ends of the main line will diminish the illusion. Experiments confirm the deduction that the illusion increases with the length of the limiting lines. MARGARET WASHBURN.

Ueber den Ursprung der richtigen Deutung unserer Sinneseindrücke. H. von Helmholtz. Z. f. Ps. u. Phys. d. Sinn., VII, 2 u. 3, pp. 81–96.

Our power to recognize an object seen is not innate, but depends upon a multitude of past experiences, which are not individually recalled in the act of recognition, and whose combined image could not be described in words. Much of our knowledge is therefore used in what may be called unconscious induction, as contrasted with logical thought, where the premises can be clearly stated. All inductions are liable to error, and false inductions in the interpretation of perceptions are called illusions. They are ordinarily incomplete inductions, based on the fact that we normally prefer to use our sense-organs in certain definite ways. When we are forced to use them abnormally, the objects thus perceived are interpreted as being what they would have to be in order to produce the given impression on the sense-organ in its ordinary use. Hallucinations whose cause lies at some definite point in the eye are recognized as subjective by the fact that they move as the eye moves, together with the difficulty of fixing the attention on what does not lie in the direct line of vision. An image on the side parts of the retina can be attended to only when it is of great intensity or objective interest, or involves a rapid alteration of the difference in brightness between neighboring parts of the field.

Margaret Washburn.

Die Wahrnehmung von Helligkeitsveränderungen. L. William Stern. Z. f. Ps. u. Phys. d. Sinn., VII, 4, pp. 249–278.

The results of the research described in this article are summed up by the author as follows: —

1. In the case of increases in brightness which succeed each other momentarily and are momentarily perceptible, the relative sensibility to change is constant: Weber's Law holds. The relative sensibility to change is one-thirtieth: not so fine, therefore, as the sensibility to difference.

2. If an objective change in brightness lasts for some time before it is noticed, the results have to be divided into those which concern 'duration of change,' and those which concern relative sensibility.

(*a*) When the rapidity of the increase in brightness is absolutely constant, the time necessary for a change to become perceptible ('duration of change') is longer, the greater the initial brightness: the relative sensibility to change is constant for all intensities.

(*b*) When the rapidity of increase in brightness is relatively constant, the duration of change is longer, the greater the initial brightness: the relative sensibility is greater, the less the initial brightness.

(*c*) For the same initial brightness, the duration of change is longer, the less the absolute velocity of change: the relative sensibility is diminished.

3. In indirect vision, *cet. par.*, the duration of change is shorter, the relative sensibility greater, than in direct vision.

4. The relative sensibility to changes for whose perception some little time is necessary, is less than that for momentarily perceptible changes.

5. The reaction time in the perception of gradual alterations in brightness has a considerable length.—The author's theoretical conclusion is that, under certain conditions, a single sensation-moment suffices to produce the peculiar impression of a *change* in brightness, and that this act of perception is fundamentally different from the other mode of recognizing change, *i.e.*, by the comparison of two phases. The two modes of perception often coöperate, but may occur independently of one another: the comparison of phases, when the change takes place very slowly, but within a wide range of intensity; the momentary impression of a transition, when the change occurs very rapidly and within narrow limits.

MARGARET WASHBURN.

Die Empfindung als Function der Reizänderung. W. PREYER. Z. f. Ps. und Phys. d. Sinn., VII, 4, pp. 241–248.

Du Bois Reymond's law regarding the excitation of motor nerves by the electric current is a special case of a more general law, affecting all nerves, and valid for all adequate stimuli. This general law may be stated as follows: The effect of stimulating a nerve increases and decreases as the *velocity* with which the amount of stimulus varies; and depends upon the distance of the limiting values within which the positive or negative alteration of the stimulus takes place. Scripture's recent experiments have confirmed the validity of this law for sensory nerves. It has also been proved to hold good for internal stimuli which operate upon nerve centres. The author found that by allowing a dog to bleed to death *very slowly*, the stimulus which ordinarily in cases of bleeding acts on the motor centres and produces convulsions was rendered quite inoperative.

MARGARET WASHBURN.

Eine bisher noch nicht beobachtete Form angeborener Farbenblindheit. (Pseudo-Monochromasie.) ARTHUR KÖNIG. Z. f. Ps. u. Phys. d. Sinn., VII, 2 u. 3, pp. 161–171.

Account of a patient whose qualitative color-system corresponds closely to that observed in monochromasia, save that traces of blue and yellow appear at the ends of the spectrum, while the distribution of brightness seen by him in the spectrum resembles that which exists in 'red blindness.' This new form of color-blindness is termed Pseudo-monochromasia. To explain it, the Hering color theory would have to assume a total lack of the red-green substance, and the existence of but slight traces of the yellow-blue substance. But this theory cannot explain the fact that the distribution of brightness varies so widely from that usual in monochromasia. The Ebbinghaus theory meets the same difficulty, though it allows the possibility of total color-blindness by reason of pathological conditions affecting the excitation on the way to the brain: no such conditions, however, exist in the patient under consideration. If we assume that the retinal elements of the Young-Helmholtz theory are not lacking in color-blindness, but have had the dependence of their excitation on the wave lengths of the stimulating light modified, an explanation of the present case becomes conceivable. We should have to suppose that the sensibility of both 'blue' and 'red' elements has been modified in the direction of the 'green' elements, so that the whole spectrum looks whitish, except at the ends, where the difference between the normal curves for blue and green is greatest, and a faint yellow or blue color accordingly appears.

MARGARET WASHBURN.

Studie zur Erklärung gewisser Scheinbewegungen. J. HOPPE. Z. f. Ps. u. Phys. d. Sinn., VII, 1, pp. 29–37.

Apparent movement after arrest of an actual movement is mainly a matter of after-images of movement. Alterations of form are due partly to the influence of things really seen, partly to after-images of previous phases of movement: they only occur in the direction of movement, the direction perpendicular to this showing no change. The contents of the after-images are exclusively furnished by objects really seen. The idea of apparent movement is mediated by parts of the retina which are greatly exhausted by continued fixation of the actual movement.

E. B. T.

The Case of John Bunyan. J. ROYCE. Psych. Rev., I, 1, pp. 22–33; 2, pp. 134–151; 3, pp. 230–240.

The author summarizes the results of his study of Bunyan's mentality somewhat as follows: —

(1) *Diathesis.* A sensitive and probably somewhat burdened nervous constitution; no evidence of serious hereditary weakness; genius. (2) *Childhood.* Frequent nocturnal and even diurnal terrors of a familiar kind. (3) *Youth.* (Marriage; poverty; religious anxiety.) Elementary insistent dreads of a conscientious sort. Later: collection of habits of questioning and doubt, quickly passing normal limits. (4) *Manhood.* (Physical condition vaguely neurasthenic.) Highly systematized mass of insistent motor speech-functions, painful, and attended by more dreads, doubts, and questionings. Persists, with one remission; contents of the insistent elements undergoes change; crisis follows, resulting in comparatively benign secondary melancholic depression, physical improvement, and cure of insistent impulses. No permanent relapse, owing to skillful self-imposed mental regimen.

E. B. T.

Funktion und Funktionsentwickelung der Bogengänge. K. L. SCHAEFER. Z. f. Ps. u. Phys. d. Sinn., Bd. VII, Heft 1, pp. 1–9.

Experiments on larvae of *Rana temporaria* show that the first appearance of rotatory vertigo is coincident in time with the completion of the development of the semi-circular canals. This accords well with the labyrinth theory of the static sense.

E. B. T.

Der Umfang des Gehörs in den verschiedenen Lebensjahren. H. ZWAARDEMAKER. Z. f. Ps. u. Phys. d. Sinn., Bd. VII, Heft 1, pp. 10–28.

The orchestral *a* is approximately the middle tone of the 'line of hearing' (= the range of our auditory sensations; corresponding to the 'field of vision'). In old age the line of hearing embraces ten, in youth eleven octaves.

E. B. T.

La valeur positive de la psychologie. G. REMACLE. Rev. de Mét., II, 2, pp. 153–172.

In trying to know ourselves by reflection, we create new states of consciousness, and, since these states actually constitute us, we create a mind, instead of analyzing one. All psychology, then, is an attempt to realize the mind, which thus becomes the final cause of psychology. The mind is only an ideal, and with each thinker a preconceived ideal. But there is also an immanent ideal of what the soul ought to be, considered as object, not as subject. The conditions of realization of this immanent ideal are these : Psychology seeks stable results, results, that is, which can be remembered. These are to be reached by strict observance of logical principle and respect for fact. Not fact-worship, though ; *that* is a survival of realism. Thought is not representative, but of independent value. Fact is worth nothing ; its interpretation everything. The times are tending to the true conception of psychology, psychology as an art. The attempt now making is to 'reproduce' a mental state as 'nature' made it. But we are nature ; let us create freely, at first hand. 'Reproduction' of events existing only in time is pure illusion. The criterion of truth and falsehood cannot here be applied, for the standard is something to be realized. The criterion in psychology is a moral one, what the mind ought to be. Do not mistake ; it is not meant that psychology should submit to the direction of ethics. It has its 'ought,' that is all, like painting or any other art, and the realization of this 'ought' is purely a matter of art.

H. C. HOWE.

ETHICAL.

The Significance of Pessimism. R. A. HOLLAND, JR. The New World, III, 10, pp. 295-311.

Pessimism is an example of one-sided development. In the eighteenth century Eudaemonism was another example of false emphasis. Widely different theories emphasize merely aspects of the truth, and when brought together furnish a more complete view. Pessimism as a final theory of life is one-sided and false, but as a description of a particular phase of life, it shows the one-sidedness of extreme hedonism and individualism, and must be taken account of in any optimistic theory that aims at rationality and completeness. Schopenhauer in his *The World as Will and Idea* finds two ways to prove that life contains more pain than pleasure. First, empirically, by making an actual comparison of the pleasures and pains of life. Secondly, by *a priori* speculation. He constructs a theory of the universe in which the life of man must contain more pain than pleasure. The world that we know is only the world of ideas; the phenomenal world is unreal. This inner reality of all things, which Schopenhauer calls Will, is in our terminology best understood as force. It is a blind, everlasting striving, but has no end in view. It is unconscious, and can therefore have no purpose. The world is at heart irrational. Man, being essentially Will, is a creature always desiring but never satisfied, and therefore doomed to a life of incessant pain. For the essence of desire and volition is a feeling of want. Pleasure is the resultant of a brief release from pain, and therefore negative. When desire is not present, ennui ensues, so that life vibrates between pain and ennui, and is relieved only by ephemeral throbs of pleasure. There exist ways, according to Schopenhauer, for lessening pain. In the course of development knowledge arose as one of the last stages in the objectification of the Will. In so far as man renounces all considerations that center upon the gratification of the Will, and is led to the pure contemplation of the Platonic Ideas, he enjoys pleasure; further, when he sees that his individuality is a delusion and universal sympathy takes possession of him, when he surrenders himself to will-lessness, release from pain follows. After stating the foregoing positions of Schopenhauer, Holland makes the following objections to them. It is an unwarranted assumption to say that the Absolute is immediately known in the inner world of desires and volitions any more than in the external world. Both are phenomenal, the only difference being that we know the latter under many forms of the understanding, the former only under the form of time. We have no immediate knowledge of the Will as absolute; we are aware of only phenomenal acts of volition. Further, we must retain the essential characteristic of Will, *i.e.*, consciousness. Schopenhauer gives us a Will that has need but is not conscious of it. Again, Schopenhauer's psychology of desire is wrong. He does not distinguish this from volition, and wrongly assumes it to be necessarily of the nature of pain. S.'s psychology of the Will and desire being wrong, his whole *a priori* demonstration falls to the ground. The empirical argument is not more defensible. As it is impossible to sum up either the pleasures or pains of life, neither naturalistic optimism nor pessimism can in this way be shown to be true.

W. H.

Hétéronomie et autonomie. E. DE HARTMANN. Rev. de Mét., II, 3, pp. 254–269.

Action is autonomous when guided by inner principle, heteronomous when yielded to external precept. Three cases arise : of action purely autonomous, purely heteronomous, or a compromise. The third is the usual case. The partial truth of heteronomy is that the ends of humanity are not fixed by the autonomy of the individual. Thus immanent heteronomy is the autonomy of the nation expressed in custom and law. It meddles not with motive, and hence is not a moral heteronomy even to the individual, who has the further satisfaction of knowing that where his autonomy and the nation's conflict, he yet modifies the latter. The transcendental heteronomy which bases itself upon the will of a transcendental legislator is another matter. This is a moral heteronomy, whose conflict with autonomy is heightened by immutability of prescription. Now no transcendental heteronomy furnishes other content than that of the moral autonomy of the prophets who served as mediators of the divine revelation, and theirs is based upon that of their people. But this content is exteriorized and referred to a transcendental legislator. This gives, though itself illusory, a temporary moral advantage. One day the illusion is discovered, and morality seems shaken. Then, as, for instance, to-day, it is needful to emphasize the fact that autonomous morality is the true morality. The ruling morality of the antique world was that of eudaemonistic pseudo-morality, that of the Age of Faith, heteronomous pseudo-morality. In Kant and Fichte first spoke the voice of autonomy. Heteronomy is an advance upon eudaemonism, yet continually sinks back to it, by holding up celestial rewards. To reconcile the defenders of heteronomous and autonomous morality against eudaemonists and anarchists, the heteronomist may demand that the autonomist do not shake the faith of the illiterate unprepared, while the latter may well ask that the heteronomist prepare the people for autonomy. Of this, unfortunately, there is no sign.

H. C. HOWE.

METAPHYSICAL AND EPISTEMOLOGICAL.

Ueber die letzten Fragen der Erkenntnistheorie und den Gegensatz des transcendentalen Idealismus und Realismus. II. Von DR. EDM. KÖNIG. Z. f. Ph., 104, 1, pp. 1–52.

The idea that there can be no metaphysic from the standpoint of a transcendental idealism is due (1) to the limitation of cognition to phenomena, and its consequent incapacity to reach things-in-themselves, and (2) to the assumption that metaphysic must be the science of a non-sensible existence that underlies the sensible world. But if, as shown, (1) rests on an 'uncritical' superstition, and the term *epistemological monism* had better be subsituted for transcendental idealism; and if for (2) there is substituted the idea of metaphysic as the science which completes the empirical sciences, there is no basis for the alleged incompatibility of epistemology and metaphysics. The assertion, moreover, of the incompatibility of transcendental idealism with the natural-science standpoint is true only if the denial of a world transcending consciousness is interpreted as equivalent to an assertion of its psychological immanence. On the other hand, all the great philosophical systems are bound up with an epistemologically transcendental realism, which makes them dogmatic, ends in contradiction, and so supports the view that metaphysic is intrinsically illusory.

This is here to be illustrated by v. Hartmann's system. To ordinary perception the world is composed of a multitude of spatially discrete, movable, and continuously changing 'things,' interacting with one another and exhibiting *independence* by entering into relations with different things, and *persistence* by enduring change of relations. Nor do the physical sciences change the essentials of this conception: the larger aggregates are composed of smaller ones merely because they can be divided into smaller bodies which display the same characteristics of 'things' more strikingly. But in philosophy the conception of the 'thing' is transformed into that of an *absolute substance*, in which the relative independence and permanence of things are made absolute. And, further, it is attempted to comprehend the whole content of experience as determined by the nature of the absolute substance. This differs from the imperceptibles of the natural sciences in that its existence is never considered problematical, and that the metaphysical question always is, *how* the facts may be derived from the nature of the Absolute. This procedure is inevitable so long as a dualistic distinction between 'being' and 'being conscious' is admitted in epistemology. The need, however, of such a transcendental realism will depend on whether the problem it attempts to solve is in itself a valid one. That problem is the deduction of the content of experience from the nature of the Absolute by purely logical laws. Only logical laws may be appealed to, for the real connection of cause and effect is itself one of the facts to be explained, and to be traced to its *reason* in the nature of the substances. Hence a metaphysical system commits suicide by having recourse to any non-logical 'positive' principles, or by declaring anything in the nature of the Absolute to be intrinsically inexplicable. This criterion proves fatal, in the first place, to *pluralist* systems, which have indeed the advantage of departing less from the apparent facts, but which can neither explain the spatial relations of the many substances, nor harmonize their transeunt causality with their independence. Monistic systems, on the other hand, though they evade the latter difficulty, never seriously deduce the Many out of the One, and, finding the One useless for the purpose of explaining experience, practically employ pluralistic conceptions. v. Hartmann, *e.g.*, assumes both place and plurality, and evades the problem of causality by making the causality an immanent one. But, even so, can a monistic theory account (1) for the regular succession of certain changes, and (2) for the succession *in time?* Lotze tried to explain (1) by the formal unity of substance, but this was a mere postulate and had to be supplemented by the Absolute's self-preservation and irritability. v. Hartmann similarly adds will to reason in the Absolute: both alike imply that the conceptual unity of the Idea does *not* suffice to explain the real connection of phenomena. And both 'will' and irritability are only particular kinds of connection.

And even if a real connection were admitted, we should know nothing about the character of that connection, which, as Lotze admits, might just as well be quite different from what it is. v. Hartmann, bolder and more consistent, asserts that it can be determined by nothing but the necessity of resolving a self-contradiction in the Absolute. This, however, implies an *alogical* element, and the world, therefore, exhibits not a pure, but an applied, logical-process. But the division of reality into a 'that,' due to the alogical and its 'what' determined by the logical, cannot be carried out: in its only intelligible form it leads back to a purely teleological, *i.e.*, not logical, determination of events.

As to temporal succession, Lotze admits that speculation can see no reason why reality should not be a timeless system of reasons and consequences, and v. Hartmann attributes time to the alogical. The alogical thus has to explain two things that wreck all panlogism, *viz.*, the temporal succession and dynamical efficacy of reality, but it explains *ignotum per ignotius*. And it does not follow that, because the alogical is the principle of reality, it is *ipso facto* the principle also of becoming and activity. For if it be so regarded, the theory of a logical order of events must be entirely given up. If, on the other hand, we cling to a logical necessity determining the course of events, we must have a timeless persistent ground in which it inheres, and how is this related to the principle of reality? The real process and its conformity to laws cannot be two quite different things: they must, therefore, somehow be *one*. But if so, the nature of that unity ultimately determines also the form of events, and their alogical character is destroyed.

In the next place, can a dogmatic metaphysic explain cognition? This question resolves itself into (1) How does the existence of *knowing* follow from that of *being?* (2) How can the individual know what is outside himself? (3) How is a knowledge of the transcendent consistent with realist epistemology? In answering (1), materialism breaks down; hylozoism, ordinary dualism, and spiritualism have to assume a gradual passage from unconsciousness to consciousness. v. Hartmann protests against this toning down of the antithesis, and explains consciousness by an inhibition or collision of unconscious processes. But, on monistic principles, when once a plurality of individual wills is considered compatible with the unity of the Absolute, why should they in any way collide or conflict? As for (2), sensation can neither have its source in the individual 'on whom it is impressed from without, nor yet lie without the individual, of whom it is a reaction.' Hartmann, like Schopenhauer, attributes the ascription of perceptions to things-in-themselves to an unconscious application of the principle of causality, and regards the feeling of a not-willed compulsion as prompting to its use. But even if this compulsion were felt as such, why should it require the application of the category of causation? And the feeling of compulsion is no original datum, but an interpretation of the difference between a state of consciousness that has been willed and one that has not, and so something dependent on the causal interpretation of sensation and not something that explains it.

And, further, when causality has been granted, it is not true that with space and time it suffices to determine the character of the transcendent reality. On the contrary, the conception of a force-center involves a reference to the feeling of effort which accompanies spontaneous motion, and so in describing things-in-themselves as centers of force a realist metaphysic ascribes a transcendent significance to a single kind of sensation, while it yet regards sensation in general as merely subjective. Its agreement with natural science in this point is unavailing ; for the distinction between the primary and secondary qualities of things has only methodological validity. Thus the realist metaphysic *fails* to pass from the sphere of sensible phenomena to the transcendentally real, and the thing-in-itself remains a mere duplicate of the object of perception.

The fact is that transcendental realism has not taken account of the Kantian maxim that concepts without sensible intuition to give them content are empty, and v. Hartmann recognized this, and protests that such concepts cannot exist. Admitting, however, that many of his criticisms of Kant are valid, it yet remains a simple fact that our thinking cannot transcend the data of experience, and that even when the right of thought to work up and elaborate these data has been fully conceded, nothing absolutely beyond experience can ever be reached. All that metaphysic, therefore, can effect is the progressive intellectualizing of the content of experience, transforming objects of perception into objects of thought.

F. C. S. S.

De la nature des explications des phénomènes naturels dans les sciences experimentales. H. BOUASSE. Rev. de Mét., II, 3, pp. 299–316.

An explanation of nature is a tracing back phenomena to force, shock, or work. This is done by first classifying phenomena under laws, then by grouping laws under theories. The essential and certain portion of a theory is composed of differential equations, among which those fundamental are the ones which bind up with time and space; force, work, and shock. These three notions, derived from the sense of touch and the muscular sense, are at the bottom of all science. Next come the logical principles, contradiction and identity; then axioms of mathematical science. From these we draw algebra and calculus; adding space, — geometry; adding time, — kinematics. Besides these, the scientist has for his guidance, 'metaphysical' principles (such as the equality of action and reaction), which are guesses at law, more or less systematic, often childish, whereby he directs his investigation of the relations of phenomena, which relations he then generalizes by induction and enunciates as laws. To classify these laws in turn, theories are necessary. The more and better defined the laws, the fewer theories, and ideally but one should be tenable. However, no science is so rich in laws but that contradictory principles may be held. Thus, as to warmth, Mayer holds that it is not, Joule that it is, a mode of motion. Both reach the same equations. In the whole progress of modern science, then, the marked feature is the enunciation of these equations, superseding thereby explanations based on hypothetical properties of matter. Science advances to a purely formal and algorithmic explanation of things.

H. C. HOWE.

La divisibilité dans la grandeur: grandeur et nombre. F. EVELLIN. Rev. de Mét., II, 2, pp. 129–152.

The physicist seems to be compelled to believe in a magnitude having parts, and not infinitely divisible; the mathematician, to postulate a magnitude continuous and infinitely divisible. The opposition is that of magnitude and number. A magnitude (say a line AB) must be divisible, for it can be supposed greater or less, not infinitely divisible, for there could be no particle greater than zero, which, infinitely multiplied, would not exceed any assignable number. Doubtless the sensible line is continuous, but we must pass to the reality, which is discontinuous. The understanding, starting with the phenomenal, goes toward the subjective and infinite; the reason starts at the same point, but proceeds to the objective and finite. Mathematics is of the understanding, physics of the reason. The atom, which rules in the physical world, is the very negation of infinite divisibility; but the mathematician admits in each finite magnitude, infinite divisibility. Mathematicians oppose number to magnitude as the discontinuous to the continuous. Back of this, however, we are compelled to see the necessary conflict of the potential or subjective (number) with the actual or objective (magnitude), the former infinite as nothing in thought, which creates it, creates a limit; the latter finite, for it is a datum. Idealism sees only the infinite, realism only the finite. Now a pure mathematics would deal only with number. Geometry and the like are mixed sciences, which, applying number to magnitude, impose upon the latter properties not its own. Hence the self-contradictory opinion among mathematicians that magnitude itself is infinitely divisible.

H. C. HOWE.

HISTORICAL.

La logique de Hegel. La science de l'être. G. Noël. Rev. de Mét., II, 3, pp. 270–298.

The realm of the doctrine of Being is that of immediate Being and its immediate determinations, quality, quantity, measure. Being can be conceived only in unity with its contrary, Nothing, that is, as Becoming. Absolute Becoming is the disappearance alike of Being and Nothing, and with them, of itself. It must become fixed, as determinate being. Here the determination is the same as being itself, and makes of it, Quality. The same process must be gone through for Nothing, arriving at Privation. Out of these two arises the Somewhat, whose relativity leads first to finitude, then to infinity, thence to infinite becoming. But each of the opposed terms in this *progressus* denies itself only to reaffirm itself. Thus regarded as self-determining, it passes us over to the One. The One disperses itself into Plurality. The truth is in neither, but in their union, Quantity. Quantity can be effectively determined only by Quality; therefore the truth passes to the unity of these two, in Measure. Being is, then, one, continuous and immutable, as quantified; multiple, discontinuous, and changing, as per quality. Thus conceived, Hegel calls it absolute indifference. This, having existence only in modifications to which it is indifferent, is absolute contradiction. But indifference of its own immediate being, and thereby of the totality of being which is absorbed in it, is no longer indifference, but Essence, absolute mediation, whose point of view subjectively is Reflection. The doctrine of Being thus deals with the problems of Greek speculation. Hegel is the only philosopher since Aristotle to treat them systematically, and had the reward of finding again philosophy, in its own history, and of showing the continuity of its evolution through diversity of systems.

H. C. Howe.

Der Einfluss Demokrit's auf Galilei. Löwenheim. Ar. f. G. Ph., VII, 2, pp. 230–268.

In view of the fact that historians now regard Galilei rather than Bacon or Descartes as the founder of modern science and philosophy, the author has for some years been engaged in studying the development of the former's system. The results of this study he promises soon to lay before the world in three large volumes, but here wishes only to give some general conclusions regarding an important factor in G.'s development. Natorp (Phil. Mon., XVIII, p. 214) quoted G. as asserting that he knew nothing either of Democritus or of Epicurus; and historians of philosophy (*e.g.* Überweg-Heinze) have accepted this statement as authoritative. But on referring to the passages, the author finds that this statement is only made regarding Epicurus; as a matter of fact in one passage G. repeatedly mentions Democritus and favors his explanation of light and heavy bodies rather than that of Aristotle. The author goes on to show that G.'s assertion that the rate at which all bodies fall to the earth is uniform, his laws of motion and of the persistence of energy—in short the entire groundwork of his physics and astronomy—are due either directly or indirectly to the influence of Democritus. To this is to be added that the view held by G. of the merely subjective nature of color, taste, sound, etc., which came into modern philosophy from him by way of Hobbes and Descartes, was first maintained by Democritus. Incidentally the author contends for the importance of Democritus' views and their kinship with modern scientific conceptions.

J. E. C.

Giordano Bruno und Spinoza. I. W. DILTHEY. Ar. f. G. Ph., VII, 2, pp. 269–283.

This first paper of a series treats of Bruno's relation to the Italian Renaissance, his early life in the Dominican order, his retirement from the priesthood, his life in Geneva and his subsequent attack on Calvinism, his life and philosophical activity in Paris and London. It was at the court of Elizabeth, in the England of Shakespeare and Sydney, that his genius reached its highest development and his spirit found freest utterance.

J. E. C.